

TCM-323

SERVICE MANUAL

Ver 1.2 2004.03

US Model
Canadian Model
AEP Model
E Model



Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-323-118

SPECIFICATIONS

Recording system
2-track 1 channel monaural
Frequency range
250 - 6,300 Hz
Speaker
Approx. 3.6 cm (1 $\frac{7}{16}$ in.) dia.
Power output
130 mW (at 10 % harmonic distortion)
Output
Earphone jack (minijack) for 8 - 300 ohms earphone
Power requirements
• Two size R6 (AA) batteries (not supplied): 3V DC
Dimensions (w/h/d) (incl. projecting parts and controls)
Approx. 112 x 91 x 36.5 mm (4 $\frac{1}{2}$ x 3 $\frac{3}{8}$ x 1 $\frac{7}{16}$ in.)
Mass (not incl. batteries)
Approx. 170g (6.0 oz)

Design and specifications are subject to change without notice.

CASSETTE-CORDER

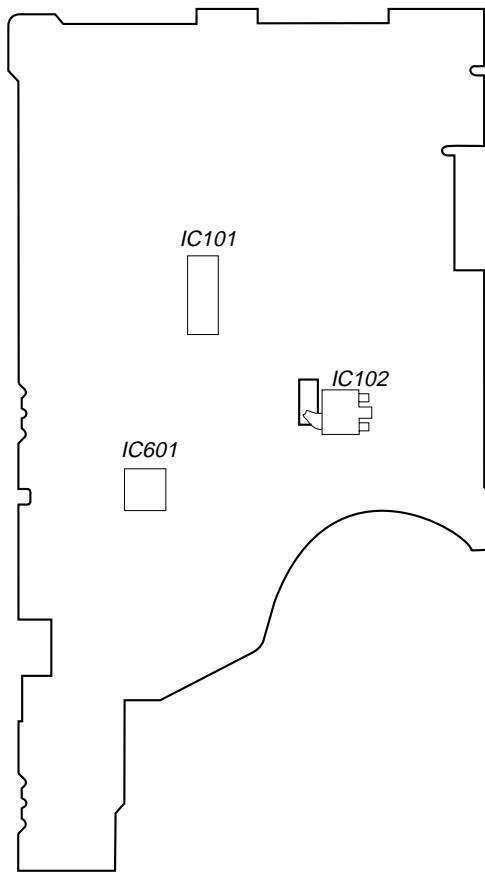
SECTION 1 SERVICING NOTES

TABLE OF CONTENTS

1. SERVICING NOTES	2
2. GENERAL	3
3. DISASSEMBLY	4
4. MECHANICAL ADJUSTMENTS	7
5. ELECTRICAL ADJUSTMENTS	8
6. DIAGRAMS	
6-1. Block Diagram	9
6-2. Schematic Diagram	11
6-3. Printed Wiring Board	13
7. EXPLODED VIEWS	14
8. ELECTRICAL PARTS LIST	17

In this set, the S102 (power) detects REC/PLAYBACK on. It is mounted on the MAIN board, and therefore the REC/PLAYBACK on cannot be detected with the MAIN board removed. When making an operation check and voltage check of mechanical deck with the MAIN board removed, fix the S102 at turn on.

[MAIN BOARD] (Conductor Side)



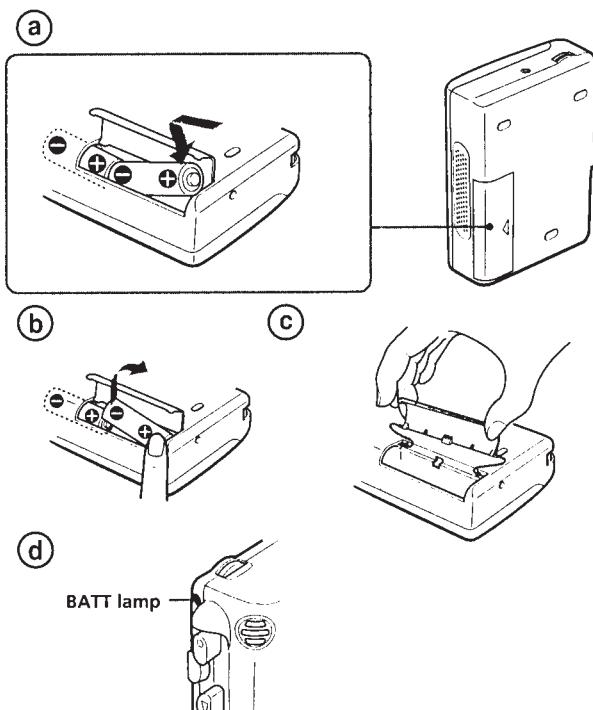
Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

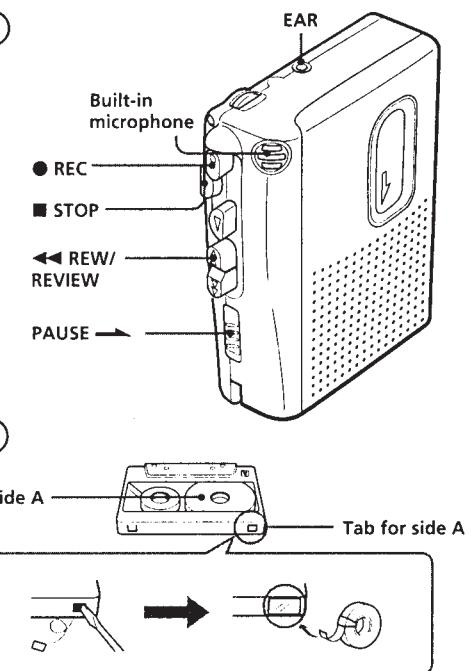
SECTION 2 GENERAL

This section is extracted from instruction manual.

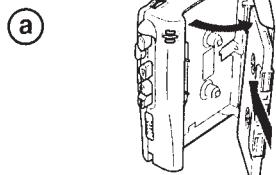
A



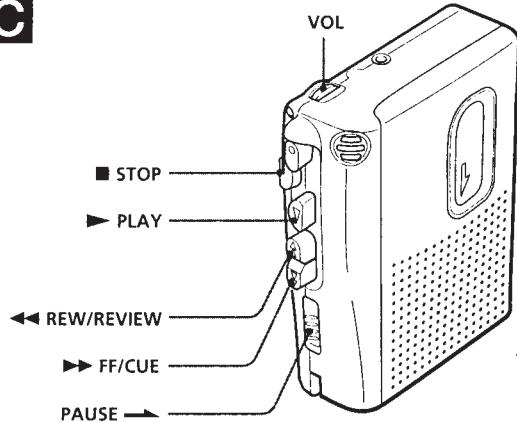
b



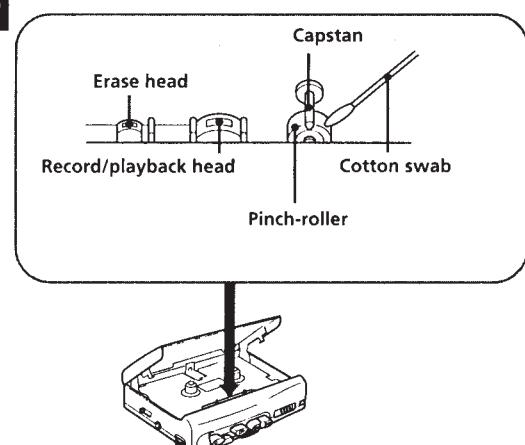
B



C



D



SECTION 3 DISASSEMBLY

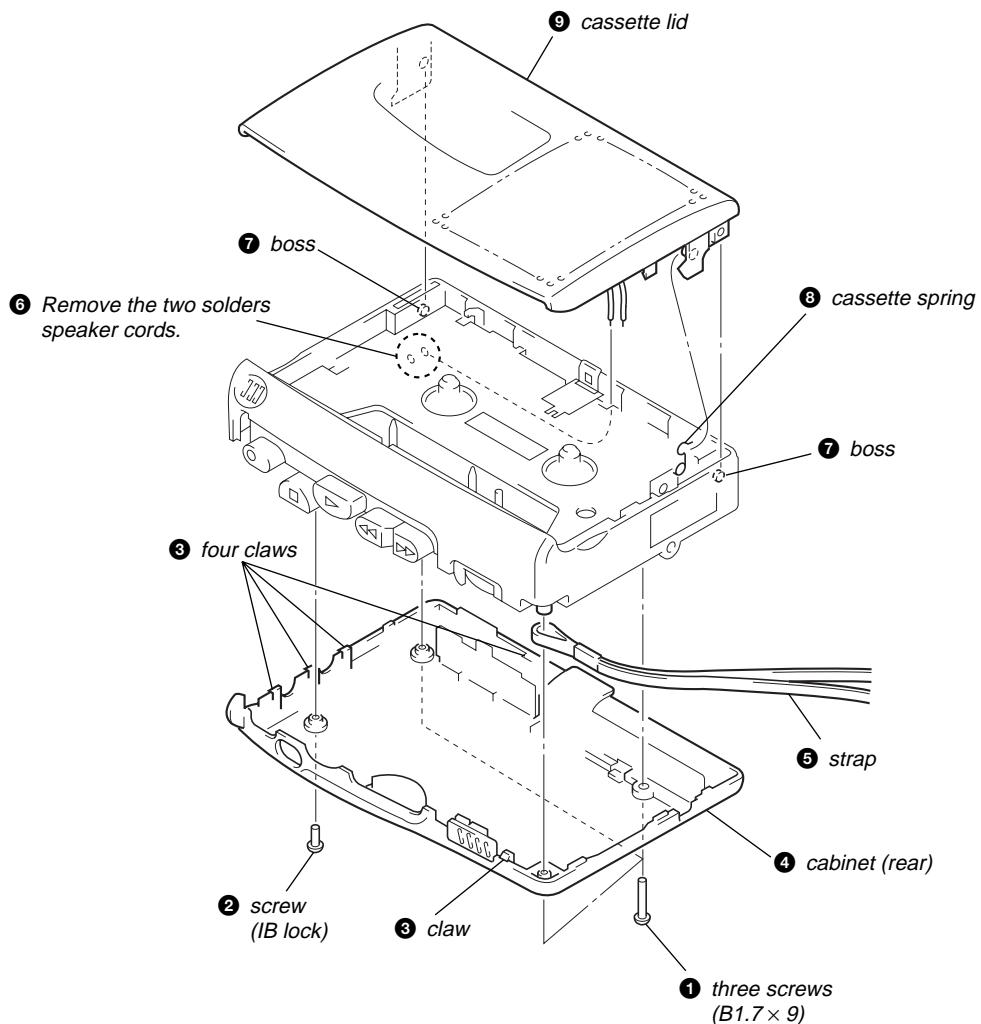
- This set can be disassembled in the order shown below.

SET → CABINET (REAR), CASSETTE LID → MAIN BOARD, MECHANISM DECK (MT-323-118)

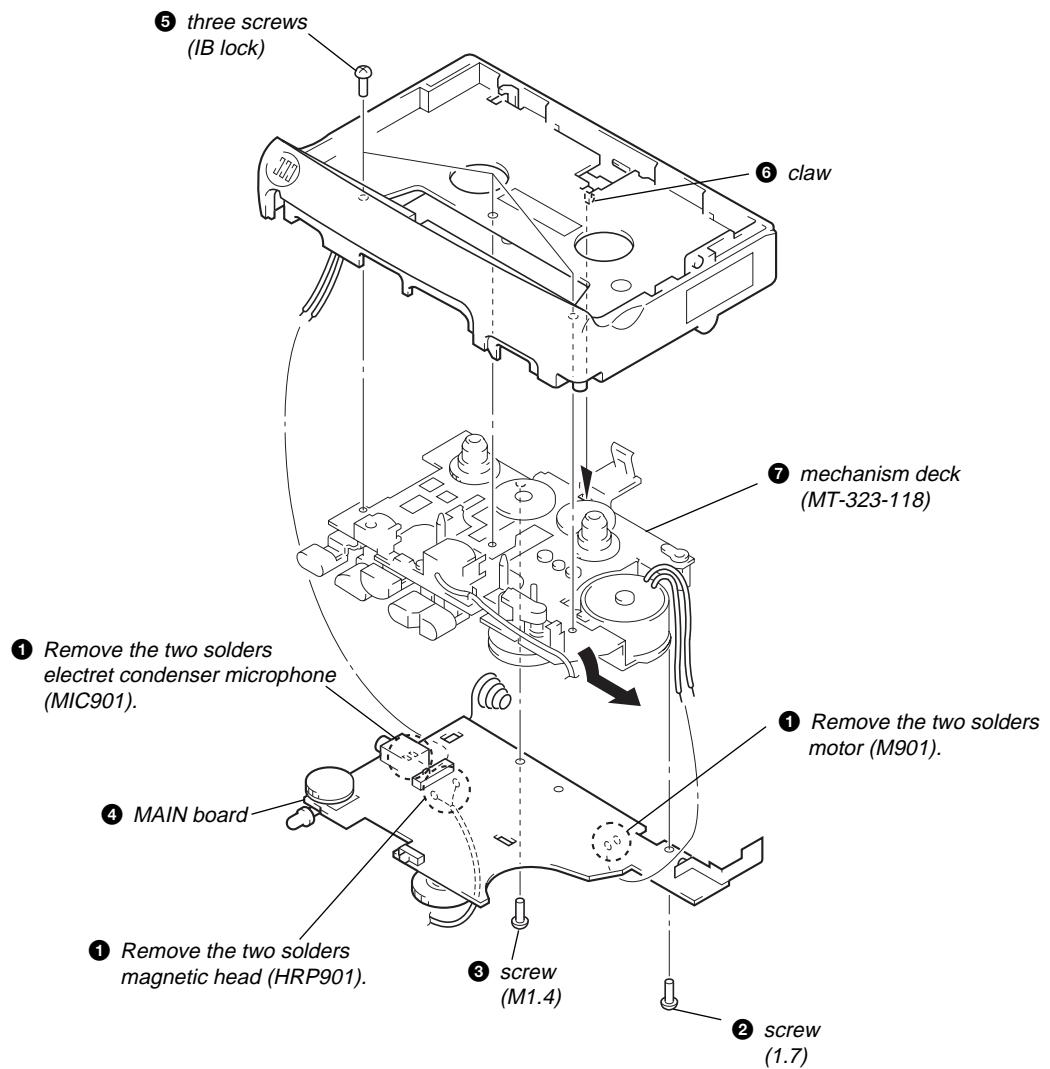
→ BELT

Note: Follow the disassembly procedure in the numerical order given.

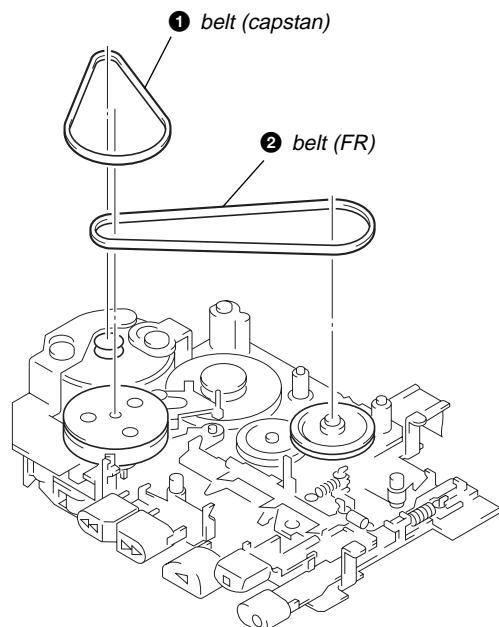
CABINET (REAR), CASSETTE LID



MAIN BOARD, MECHANISM DECK (MT-323-118)

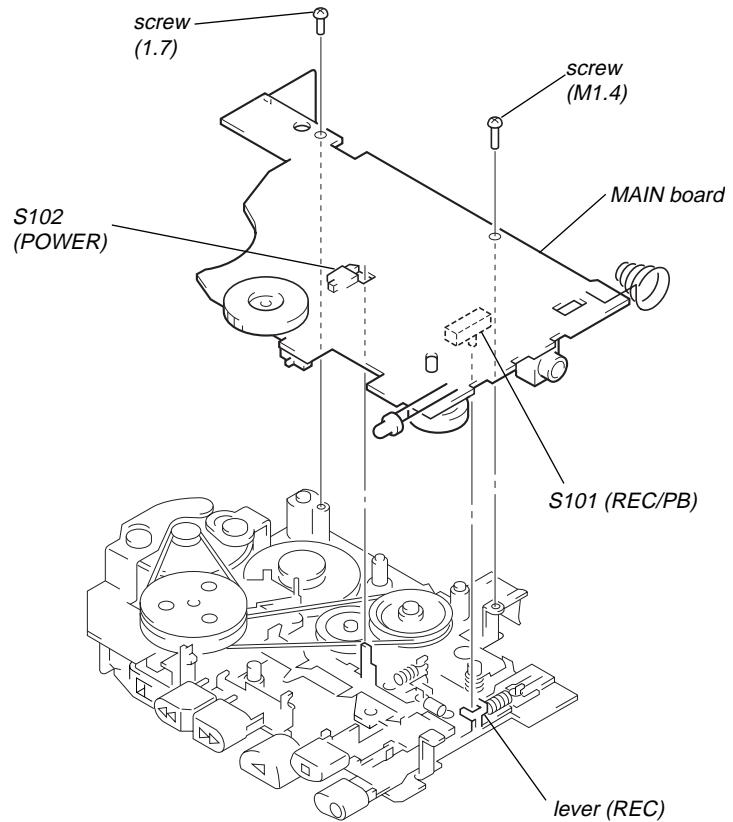


BELT



INSTALLATION MAIN BOARD

On installation MAIN board, adjust to the S101 and the S102.



SECTION 4

MECHANICAL ADJUSTMENTS

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belt
capstan	idle
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	more than 20 g•cm (more than 0.28 oz•inch)
Forward Back Tension		0.5 - 3 g•cm (0.007 - 0.04 oz•inch)
FF	CQ-201B	more than 50 g•cm (more than 0.69 oz•inch)
REW		

Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403C	more than 50 g (more than 1.76 oz)

SECTION 5

ELECTRICAL ADJUSTMENTS

Precaution

- Supplied voltage: 2.5 V
- Switch and control position
PAUSE switch (S105): OFF
VOL (RV101): mechanical mid

Test Tape

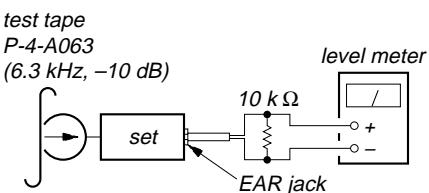
Type	Signal	Used for
P-4-A063	6.3 kHz, -10 dB	head azimuth adjustment
WS-48A	3 kHz, 0 dB	tape speed adjustment

0 dB=0.775 V

Record/Playback Head Azimuth Adjustment

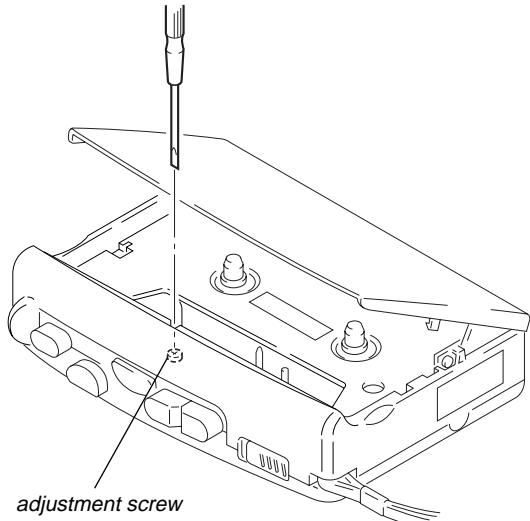
Procedure:

Mode: playback



1. Turn the adjustment screw to obtain the maximum reading on level meter.
Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

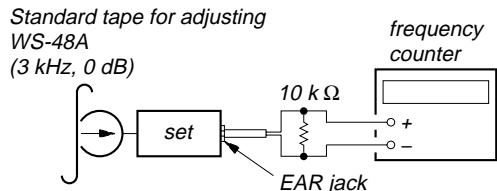
Adjustment Location:



Tape Speed Adjustment

Procedure:

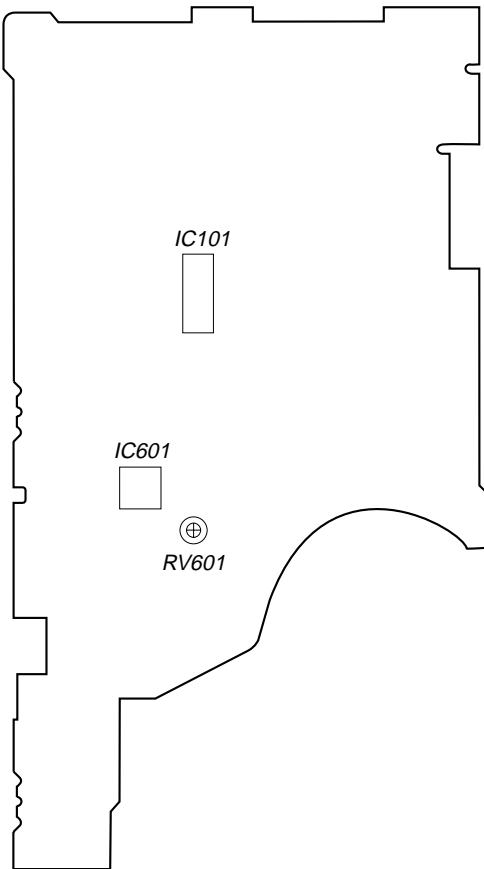
Mode: playback



1. Play back WS-48A (tape end part) and adjust RV601 so that the frequency counter reading becomes $3,000 \pm 15$ Hz.
2. Play back WS-48A tape the beginning and the end part, check that the frequency counter reading is within same standard of step1.

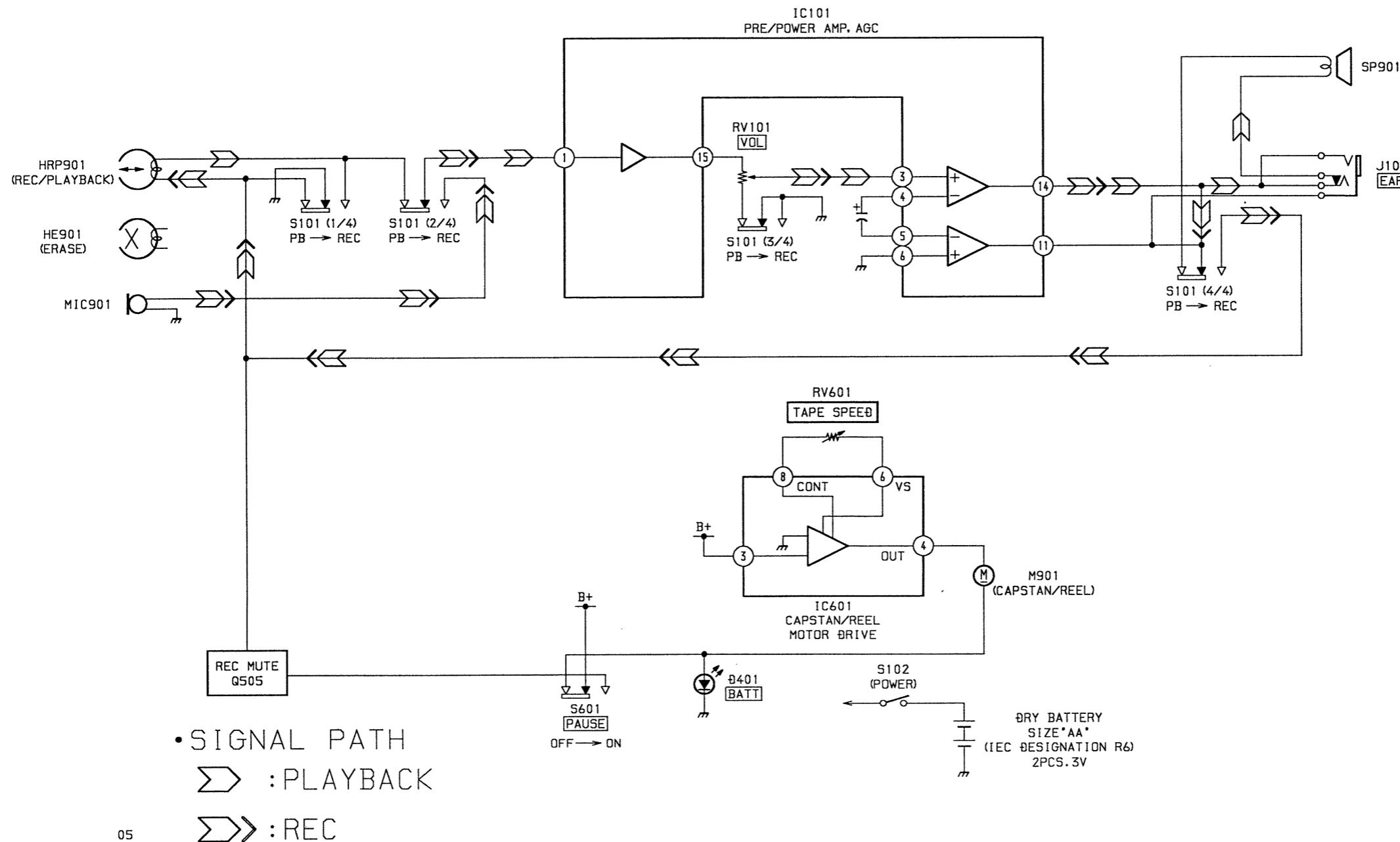
Adjustment Location:

[MAIN BOARD] (Conductor Side)



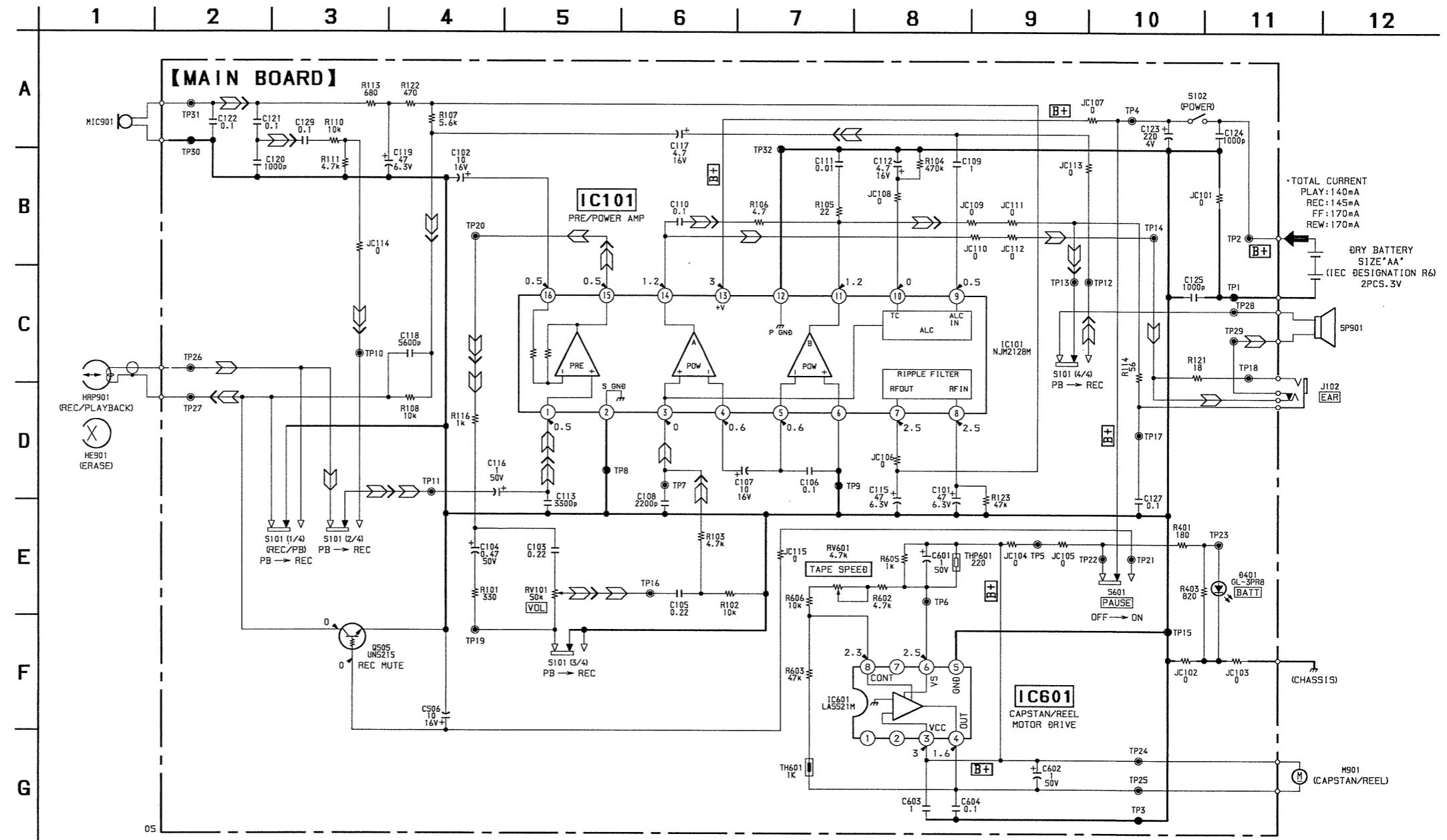
SECTION 6
DIAGRAMS

6-1. BLOCK DIAGRAM



05

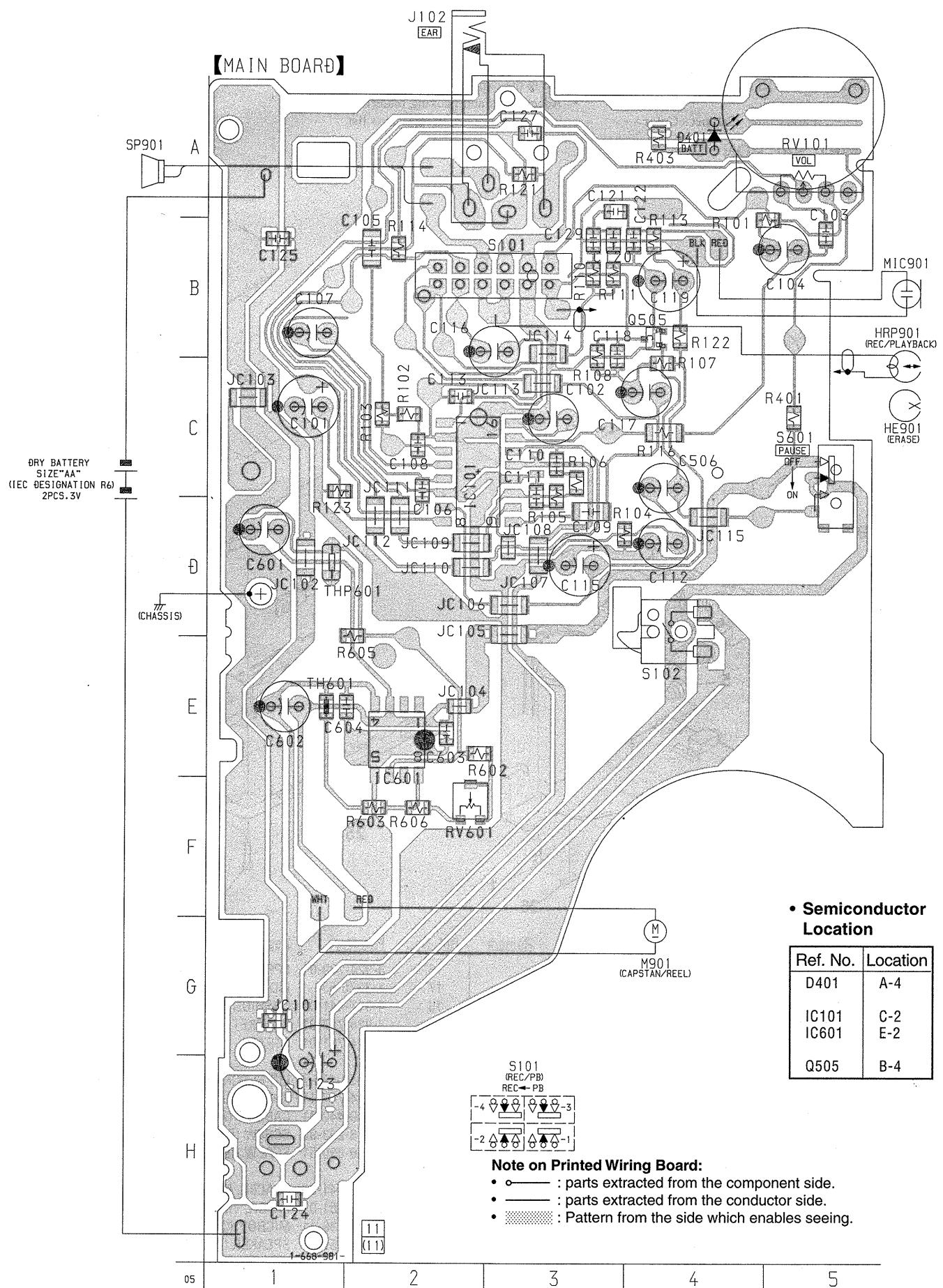
6-2. SCHEMATIC DIAGRAM



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu\text{F}$
50 WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $1/4\text{ W}$ or less unless otherwise specified.
 -  : panel designation.
 -  : B+ Line.
 -  : adjustment for repair.
 - Power voltage is dc 3 V and fed with regulated dc power supply from battery terminal.
 - Voltages are dc with respect to ground under no-signal conditions.
no mark : PB
() : REC
 - Voltages are taken with a VOM (Input impedance $10\text{ M}\Omega$). Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 : PB
 : REC

6-3. PRINTED WIRING BOARD



Note on Printed Wiring Board:

- Note on Printed Wiring Board:**

 - : parts extracted from the component side.
 - : parts extracted from the conductor side.
 -  : Pattern from the side which enables seeing.

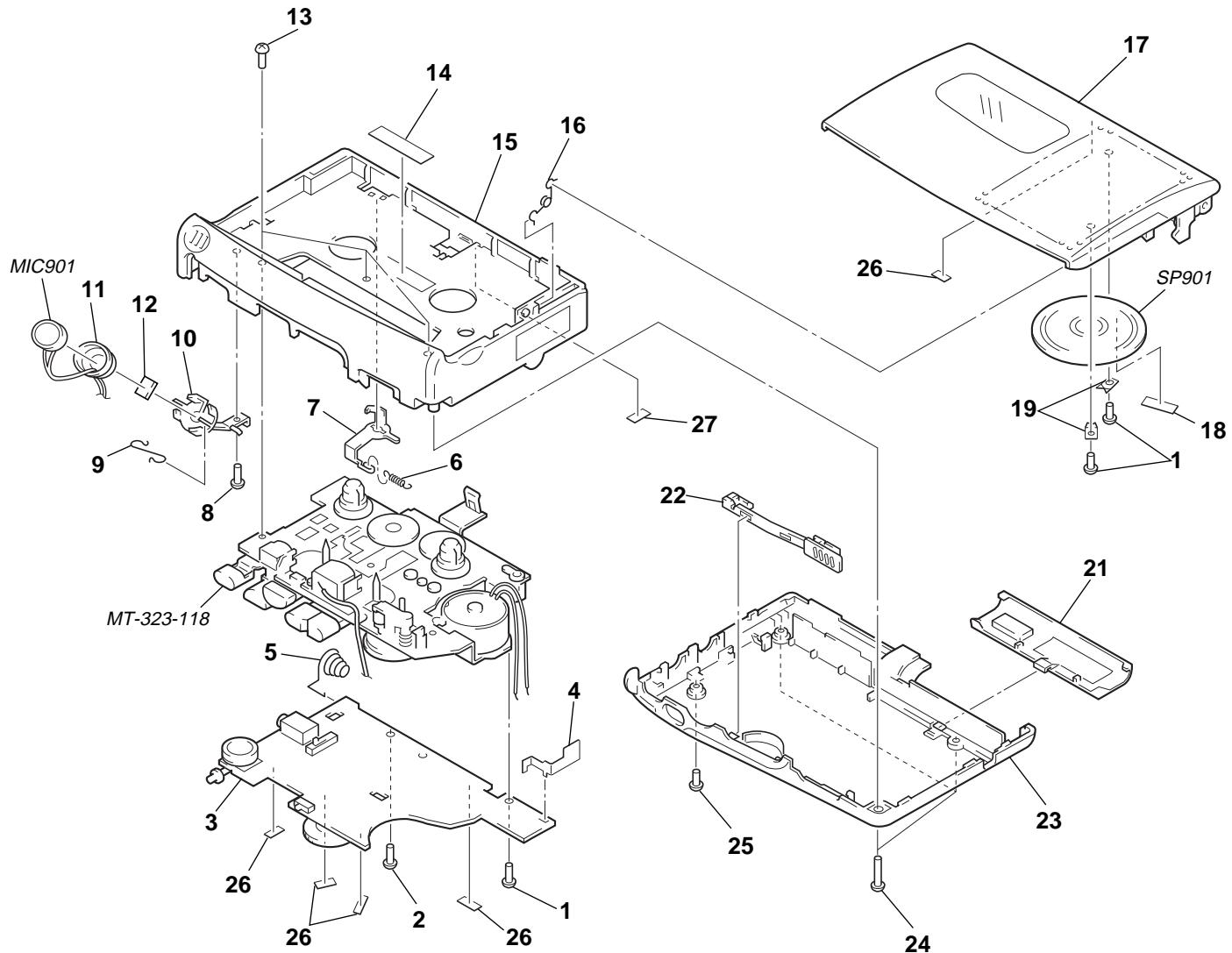
SECTION 7

EXPLODED VIEWS

NOTE:

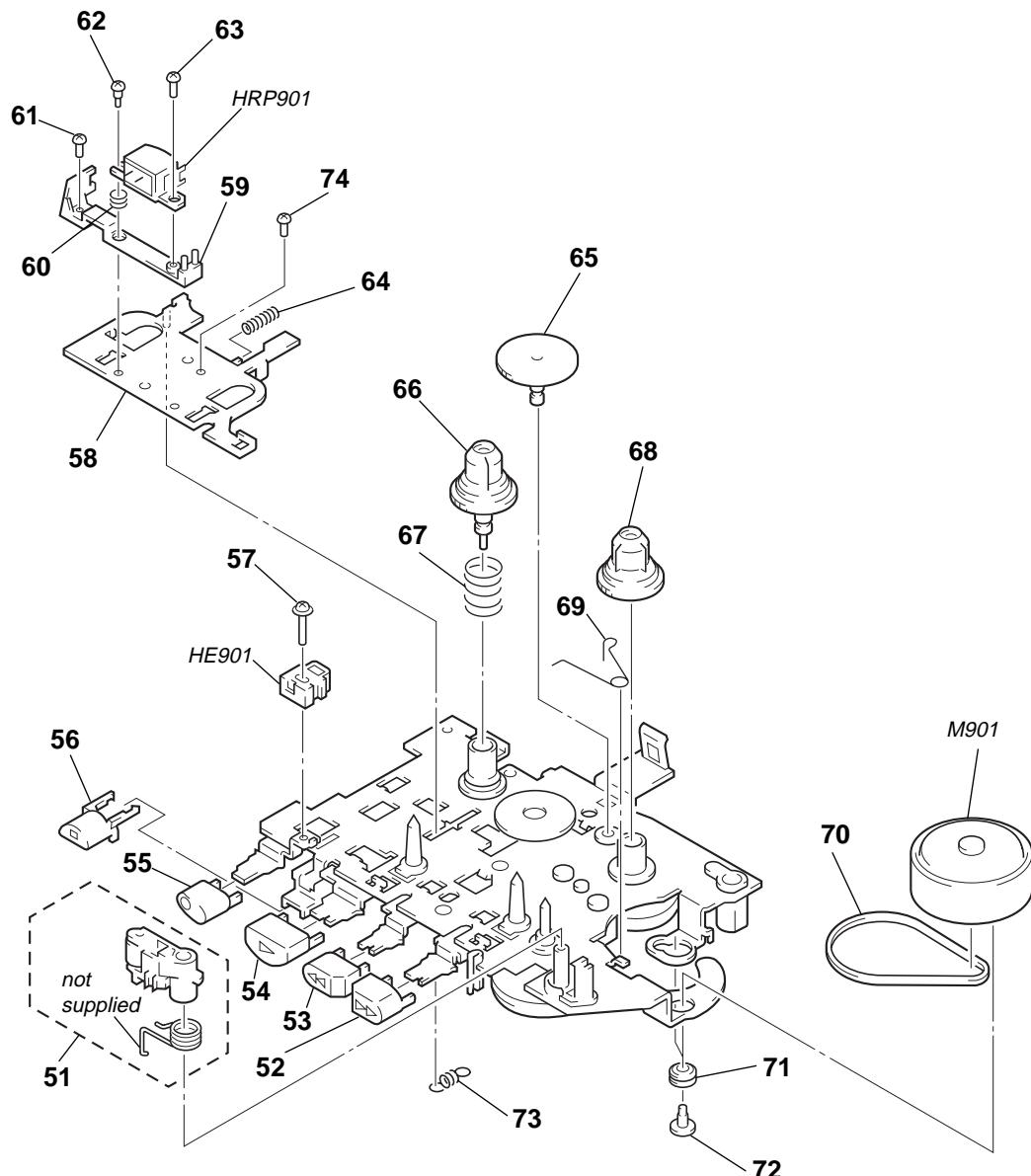
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
 - The mechanical parts with no reference number in the exploded views are not supplied.
 - Accessories and packing materials are given in the last of the electrical parts list.

(1) CABINET SECTION



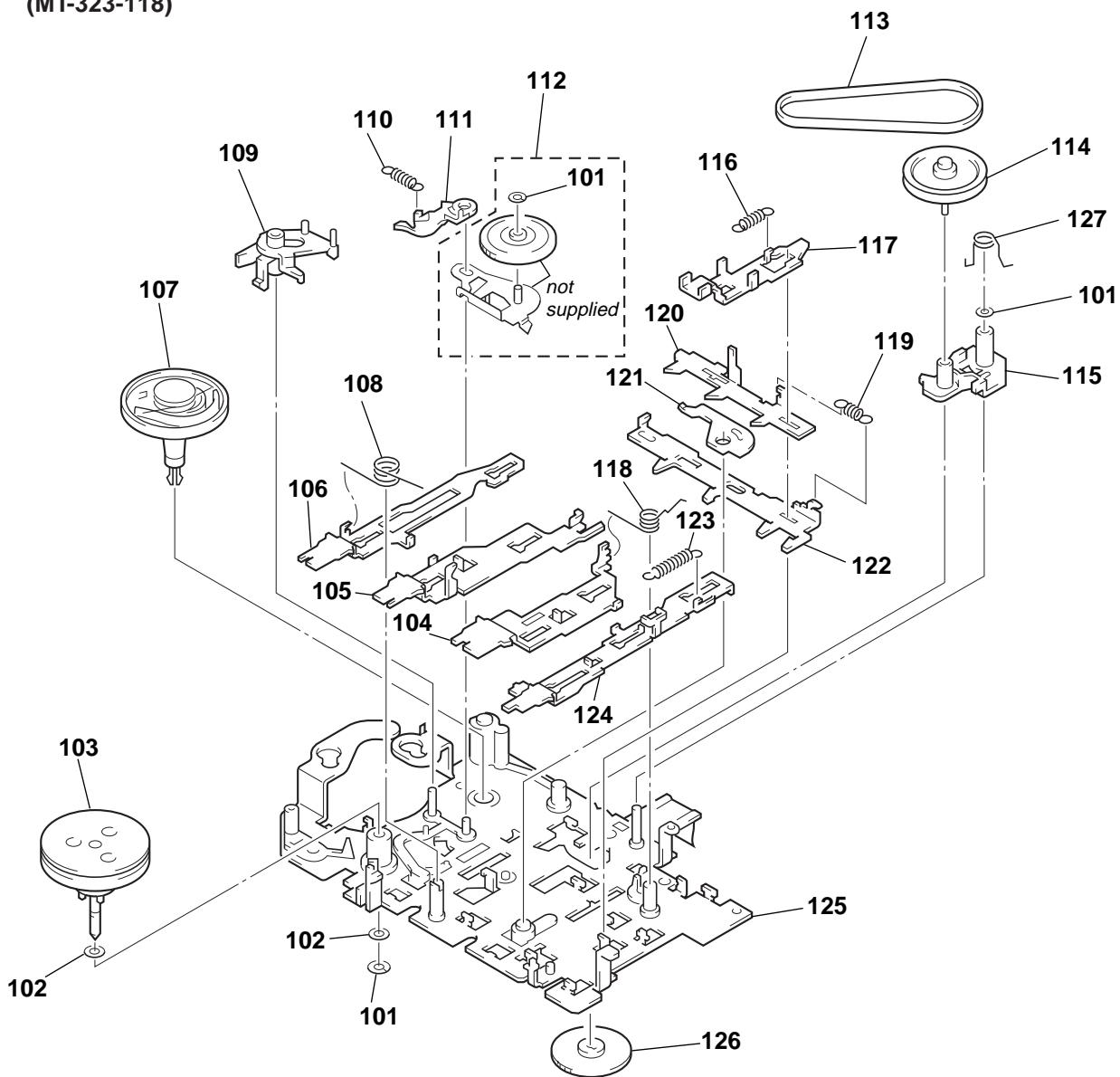
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-318-382-31	SCREW (1.7), TAPPING		16	3-924-739-01	SPRING, CASSETTE	
2	3-345-648-01	SCREW (M1.4), TOOTHED LOCK		17	X-3375-536-1	LID SUB ASSY, CASSETTE	
* 3	A-3021-006-A	MAIN BOARD, COMPLETE		18	4-017-441-01	CUSHION (B)	
4	3-924-741-01	TERMINAL, PLUS		* 19	3-924-757-01	BRACKET (SPEAKER)	
5	3-936-973-01	TERMINAL, MINUS		21	X-3375-808-1	LID ASSY, BATTERY CASE	
6	3-924-744-01	SPRING(CLAW DETECTION), TENSION		22	3-924-747-11	KNOB (PAUSE)	
7	3-924-743-01	CLAW, ERASING PROTECTION		23	3-019-442-01	CABINET (REAR)	
8	3-334-565-41	SCREW (B1.7), TAPPING		24	3-318-203-92	SCREW (B1.7X9), TAPPING	
9	3-924-745-01	BAR, GROUND		25	3-366-890-51	SCREW (IB LOCK)	
10	3-924-740-01	HOLDER, MICROPHONE		26	3-831-441-99	SPACER, KNOB	
11	3-924-763-01	CUSHION (MICROPHONE)		* 27	3-592-351-01	PAPER, VIBRATION PROOF (B)	
12	3-831-441-11	CUSHION, CABINET UPPER 10X7X0.5		MIC901	1-542-136-11	MICROPHONE, ELECTRET CONDEDSEER (MIC)	
13	4-969-980-21	SCREW (IB LOCK)		SP901	1-544-657-11	SPEAKER (3.6CM)	
14	3-578-101-31	PLATE, ORNAMENTAL					
15	3-019-363-01	CABINET (FRONT)					

(2) MECHANISM DECK SECTION-1
(MT-323-118)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	X-3370-386-1	PINCH ROLLER ASSY		65	3-924-637-01	GEAR (FF)	
52	3-925-146-11	BUTTON (FF) (▶▶)		66	3-924-673-01	GEAR (S REEL)	
53	3-925-147-01	BUTTON (REW) (◀◀)		67	3-924-674-01	SPRING (B. T), COMPRESSION	
54	3-925-148-11	BUTTON (PLAY) (▶)		68	3-924-641-01	GEAR (T REEL)	
55	3-925-145-01	BUTTON (REC) (●)		69	3-924-726-01	SPRING (M GROUND), TORSION	
56	3-924-738-01	BUTTON (STOP) (■)		70	3-924-681-01	BELT (CAPSTAN)	
57	3-703-925-21	SCREW (M1.4)		71	3-925-109-01	CUSHION (MOTOR)	
58	3-924-625-01	LEVER (HEAD)		72	3-925-108-01	SCREW (MOTOR)	
59	3-924-645-01	BRACKET (HEAD)		73	3-924-644-01	SPRING (POWER TENSION), TENSION	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION		74	3-348-160-11	SCREW (M1.4X1.6), PRECISION PAN	
61	3-704-197-91	SCREW (IB LOCK)		HE901	1-500-232-11	HEAD, MAGNETIC (ERASE)	
62	3-375-135-01	SCREW (1.4), SPECIAL		HRP901	1-500-073-51	HEAD, MAGNETIC (RECORD/PLAYBACK)	
63	3-376-177-01	SCREW (M1.4X3.8)		M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION					

**(3) MECHANISM DECK SECTION-2
(MT-323-118)**



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-321-483-11	RING, RETAINING (0.25)		115	3-924-628-01	LEVER (FR)	
102	3-315-495-31	WASHER		116	3-924-633-01	SPRING (STOP), TENSION	
103	X-3370-384-1	FLYWHEEL ASSY		117	3-924-622-01	LEVER (STOP)	
104	3-924-623-01	LEVER (PLAY)		118	3-924-643-01	SPRING (PR), TORSION	
105	3-924-621-01	LEVER (REW)		119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
106	3-924-620-01	LEVER (FF)		120	3-924-619-01	LEVER (SW)	
107	X-3370-388-1	TABLE ASSY, FELT		121	3-924-639-01	LEVER (CR)	
108	3-924-642-01	SPRING (FR), TORSION		122	3-924-618-01	LEVER (LOCK)	
109	3-924-629-01	LEVER (DETECTION)		123	3-925-208-01	SPRING (REC), TENSION	
110	3-925-207-01	SPRING (S. OFF), TENSION		124	3-924-624-01	LEVER (REC)	
111	3-924-630-01	LEVER (S.OFF)		125	X-3370-227-1	CHASSIS ASSY	
112	X-3370-387-1	LEVER ASSY, IDLER		126	3-924-613-01	GEAR (FR)	
113	3-924-682-01	BELT (FR)		127	3-024-378-01	SPRING (FR LEVER), TORSION	
114	X-3370-385-1	PULLEY (FR) ASSY					

SECTION 8

ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
 - -XX and -X mean standardized parts, so they may have some difference from the original one.
 - **RESISTORS**
All resistors are 1/4W.

All resistors are in ohms.

METAL: Metal-film resistor.

METAL OXIDE: Metal oxide-film resistor.

F: nonflammable

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
 - **SEMICONDUCTORS**
In each case, u: μ , for example:
uA. . . : μ A. . . uPA. . . : μ PA. . .
uPB. . . : μ PB. . . uPC. . . : μ PC. . .
uPD. . . : μ PD. . .
 - **CAPACITORS**
uF: μ F
 - **COILS**
uH: μ H

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
*	A-3021-006-A	MAIN BOARD, COMPLETE			*****			< JACK >			
		< CAPACITOR >				J102	1-766-847-11	JACK (EAR)			
								< SHORT >			
C101	1-104-357-11	ELECT	47uF	20%	6.3V	JC101	1-216-295-00	SHORT	0		
C102	1-104-396-11	ELECT	10uF	20%	16V	JC102	1-216-296-00	SHORT	0		
C103	1-164-222-11	CERAMIC CHIP	0.22uF		25V	JC103	1-216-296-00	SHORT	0		
C104	1-126-159-11	ELECT	0.47uF	20%	50V	JC104	1-216-295-00	SHORT	0		
C105	1-163-081-00	CERAMIC CHIP	0.22uF		25V	JC105	1-216-296-00	SHORT	0		
C106	1-163-038-00	CERAMIC CHIP	0.1uF		25V						
C107	1-104-396-11	ELECT	10uF	20%	16V	JC106	1-216-296-00	SHORT	0		
C108	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	JC107	1-216-296-00	SHORT	0		
C109	1-162-638-11	CERAMIC CHIP	1uF		16V	JC108	1-216-295-00	SHORT	0		
C110	1-163-038-00	CERAMIC CHIP	0.1uF		25V	JC109	1-216-296-00	SHORT	0		
						JC110	1-216-296-00	SHORT	0		
C111	1-164-232-11	CERAMIC CHIP	0.01uF		50V						
C112	1-126-163-11	ELECT	4.7uF	20%	50V	JC111	1-216-296-00	SHORT	0		
C113	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V	JC112	1-216-296-00	SHORT	0		
C115	1-104-357-11	ELECT	47uF	20%	6.3V	JC113	1-216-296-00	SHORT	0		
C116	1-104-411-11	ELECT	1uF	20%	50V	JC114	1-216-296-00	SHORT	0		
						JC115	1-216-296-00	SHORT	0		
C117	1-126-163-11	ELECT	4.7uF	20%	50V						
C118	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V			< TRANSISTOR >			
C119	1-104-357-11	ELECT	47uF	20%	6.3V						
C120	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	Q505	8-729-014-12	TRANSISTOR	RN1311-TE85L		
C121	1-163-038-00	CERAMIC CHIP	0.1uF		25V						
								< RESISTOR >			
C122	1-163-038-00	CERAMIC CHIP	0.1uF		25V						
C123	1-124-434-00	ELECT	220uF	20%	4V	R101	1-216-037-00	METAL CHIP	330	5%	1/10W
C124	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	R102	1-216-073-00	METAL CHIP	10K	5%	1/10W
C125	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	R103	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
C127	1-163-038-00	CERAMIC CHIP	0.1uF		25V	R104	1-216-113-00	METAL CHIP	470K	5%	1/10W
						R105	1-216-009-00	METAL CHIP	22	5%	1/10W
C129	1-163-038-00	CERAMIC CHIP	0.1uF		25V						
C506	1-104-396-11	ELECT	10uF	20%	16V	R106	1-216-308-00	METAL CHIP	4.7	5%	1/10W
C601	1-104-411-11	ELECT	1uF	20%	50V	R107	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
C602	1-104-411-11	ELECT	1uF	20%	50V	R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
C603	1-164-346-11	CERAMIC CHIP	1uF		16V	R110	1-216-073-00	METAL CHIP	10K	5%	1/10W
						R111	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
C604	1-163-038-00	CERAMIC CHIP	0.1uF		25V						
						R113	1-216-045-00	METAL CHIP	680	5%	1/10W
		< DIODE >				R114	1-216-019-00	METAL CHIP	56	5%	1/10W
D401	8-719-057-27	LED	L-132XHD (BATT)			R116	1-216-198-00	RES,CHIP	1K	5%	1/8W
						R121	1-216-609-11	METAL CHIP	18	0.5%	1/10W
		< IC >				R122	1-216-041-00	METAL CHIP	470	5%	1/10W
IC101	8-759-339-54	IC	NJM-2128M-TE2								
IC601	8-759-804-43	IC	LA5521M			R123	1-216-089-00	RES,CHIP	47K	5%	1/10W
						R401	1-216-031-00	METAL CHIP	180	5%	1/10W
						R403	1-216-047-00	RES,CHIP	820	5%	1/10W
						R602	1-216-065-00	RES,CHIP	4.7K	5%	1/10W
						R603	1-216-089-00	RES,CHIP	47K	5%	1/10W

MAIN

Ref. No.	Part No.	Description			Remark
R605	1-216-049-11	RES,CHIP	1K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W

< VARIABLE RESISTOR >

RV101 1-223-293-11 RES, VAR, CARBON 50K (VOL)
 RV601 1-238-663-11 RES, ADJ, CARBON 4.7K

< SWITCH >

S101 1-572-964-11 SWITCH, SLIDE (REC/PB)
 S102 1-771-092-21 SWITCH, PUSH (1 KEY) (POWER)
 S601 1-572-922-11 SWITCH, SLIDE (PAUSE)

< THERMISTOR >

TH601 1-808-819-11 THERMISTOR, NTC (2125)
 THP601 1-810-007-11 THERMISTOR, POSITIVE

MISCELLANEOUS

HE901 1-500-232-11 HEAD, MAGNETIC (ERASE)
 HRP901 1-500-073-51 HEAD, MAGNETIC (RECORD/PLAYBACK)
 M901 1-698-588-11 MOTOR, DC (CAPSTAN/REEL)
 MIC901 1-542-136-11 MICROPHONE, ELECTRET CONDEDSER (MIC)
 SP901 1-544-657-11 SPEAKER (3.6CM)

ACCESSORIES & PACKING MATERIALS

3-862-170-11 MANUAL, INSTRUCTION (ENGLISH, FRENCH)
 3-862-170-21 MANUAL, INSTRUCTION (GERMAN, DUTCH,
 ITALIAN, SWEDISH, FINNISH) (AEP)
 3-862-170-31 MANUAL, INSTRUCTION
 (SPANISH, PORTUGUESE) (AEP, East European)
 3-862-170-41 MANUAL, INSTRUCTION (SPANISH, ITALIAN)
 (UK)
 3-862-170-81 MANUAL, INSTRUCTION (ENGLISH, GERMAN,
 POLISH, RUSSIAN, HUNGARIAN, CZECH)
 (East European)

MEMO

REVISION HISTORY

Clicking the version allows you to jump to the revised page.

Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.